



INTRODUCTION TO COMPUTER MUSIC



FM SYNTHESIS

A classic synthesis algorithm

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Frequency Modulation

- Frequency modulation occurs naturally:
 - Voice inflection, natural jitter, and vibrato in singing
 - Vibrato in instruments 
 - Instrumental effects, e.g. electric guitar 
 - Many tones begin low and come up to pitch
 - Loose vibrating strings go sharp as they go louder
 - Slide trombone, Theremin, voice, violin, etc. create melodies by FM (as opposed to, say, pianos)



Frequency Modulation with Nyquist

- **fmosc**(*basic-pitch*, *fm-control* [, *table* [, *phase*]])
 - *fm-control* is expressed as deviation in Hz
- **hzosc**(*fm-control*)
 - *fm-control* is absolute frequency in Hz
- **snd-compose**(*f*, *g*)
 - Computes $f(g(t))$ – if *g* is non-linear, frequency changes occur